1500) 6 1/3 *raṭl*[317] and thus corresponded to a weight of 2.786kg wheat or to 4.32 litres, as a measure of capacity.

2.2.24.5 Anatolia

In medieval Anatolia, there existed a variety of *müdd* measures of capacity. With regard to the time around the year 1330, al-'Umarī [d. 1348/49][318] presented comparative data on the Egyptian *irdabb*, which amounted (according to our own calculations) to about 69.5kg of wheat or about 90 litres. Accordingly, the *müdd* of Kastamonu, Konya, İznik, Manisa, Antalya and Karahisar corresponded to one *irdabb*. In Denizli, the *müdd* was said to have amounted to 3/4 *irdabb* (about 67.5 litres), whereas in Kütahya and Bursa the rate was one *müdd* to 1 1/4 *irdabb* (112.5 litres).

More reliable is the information from the time around the year 1518 with regard to the Anatolian provincial *müdd*: in Mardin 100 *müdd* corresponded at that time to 8 *kīle* (see *kīle*) of Istanbul.[319] One *müdd* amounted thus to 2.052kg of wheat or 2.66 litres. In Harpurd, one *müdd* equalled 8 *kīle* of Istanbul[320] and thus corresponded to a weight of 205.25kg or 266.7 litres. The *müdd* of Arapgir was half the size of the Harpurd-*müdd* [321] and thus measured 133.3 litres.

More significant, however was the Anatolian and later Ottoman "imperial *müdd*". As early as around the year 1335, Pegolotti[322] had reported that one "*moggio*" *(müdd)* of grain equalled 20 "*ghille*" *(kīle)* in southern Anatolia, in contrast to Cyprus. The kitchen-storeroom journal from the year 1474 of Meḥmed II[323*] confirms that one *müdd* amounted officially to 20

317 Arab Archery, p. 116.
318 *Notices et extraits* XIII, pp. 356–72.
319 *Tarih Vesikaları* I, p. 102.
320 Ibid., p. 193.
321 Ibid., p. 196.
322 *La pratica della mercatura*, p. 43.
323 *TOEM*, no. 49, pp. 26 and 55, respectively.
* Ottoman sultan, the conqueror of Constantinople, r. 1444–46 and 1451–81 (transl.).

kīle, thus weighing with regard to wheat 513.12kg, and with regard to barley around 445kg, thus corresponding to a capacity of about 664.4 litres.

2.2.24.6 'Irāq

Apparently, the measurement according to *mudd* was seldom carried out in 'Irāq. Only al-Muqaddasī[324] [fl. 10th century] with regard to Mossul* and Nusaybin** mentioned one *mudd* as corresponding to 1/3 *makkūk* (see *makkūk*), and thus equal to 2.5 litres.

2.2.24.7 Iran

The Iranian *mudd* seems to have prevailed only up to the 14th century, and even then was quite seldom used, since weighing was preferred to measuring. Al-Muqaddasī[325] [fl. 10th century] mentioned with regard to Marāghah that the local *mudd* was equal to the *qafīz* at 10 *mann* and thus corresponded to a weight of 8.3kg or a capacity of about 10.8 litres. From a Persian administrative handbook of the late 14th century[326] we know of a *mudd* at 10 (big) *mann*, i.e., about 30kg (wheat) and of a *mudd-i sulṭāniyyah* or "royal *mudd*" [sic; or, more correctly: "*mudd* of the northern Iranian city and royal residence of Sulṭāniyyah?] at 100 *mann*, i.e., about 300kg (rice).

2.2.25 *paymānah*

An Iranian measure of capacity for wine, vinegar, melted sheep's butter and the like, standardized around the year 1300 by Ghazan Khān [Īlkhānid, r. 1295–1304] in such a manner that it corre-

324 *BGA* III (2), p. 145.
* A city in 'Irāq (transl.).
** A town now in Southeastern Turkey (transl.).
325 *BGA* III (2), p. 381.
326 *Risālah-yi Falakiyyiah*, ed. Walther Hinz (Wiesbaden 1952), fols. 112b, 115b and 121a.

sponded always to 10 *mann* of Tabrīz, i.e., 8.3kg, which meant that there had been different sizes of *paymānah*-vessels, depending on the liquid that was to be measured.[327]

2.2.26 *qabb*

A dry measure, from the Greek *kabos*, prevalent especially in Jerusalem, equalling $^1/_6$ *qafīz*,[328] and thus 19.47kg of wheat or 25 litres.

2.2.27 *qadaḥ*

An Egyptian dry measure of two-fold size: 16 "small *qadaḥ*" constituted one *waybah* and 96 "small *qadaḥ*" amounted to one *irdabb*, and 8 "big *qadaḥ*" constituted one *waybah*, whereas 48 "big *qadaḥ*" amounted to one *irdabb*. Of the contradictory statements concerning the size of the *qadaḥ*, al-Qalqashandī's [1355–1418] note[329] seems to be the most reliable according to which one small *qadaḥ* amounted to 232 *dirham* of cereals or 716.83g (wheat). Correspondingly, and with regard to the results of our calculation of the *irdabb* (see *irdabb*), one small *qadaḥ* measured 0.94 litre and one big *qadaḥ* 1.88 litres. Today, one *qadaḥ* amounts officially to 2.062 litres, and there remains only *one qadaḥ*-measure.[330]

2.2.28 *qadūs*

A Maghribine dry measure, in Ténès,* equalling 3 *mudd* of the

[327] Rashīd al-Dīn, ed. K. Jahn (Gibb Memorial), p. 291

[328] Al-Muqaddasī, in: *BGA* III (2), p. 181.

[329] Al-Qalqashandī, *Ṣubḥ*, III, p. 445. A. Gonsales, *Hiervsalemsche Reyse, II. Deel* (Antwerp 1673), p. 84, mentioned only a rate of 48 *qadaḥ* = one *irdabb*. This *qadaḥ* however, would according to my own calculations only amount to 1.56 litres (instead of 1.88 litres).

[330] *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 24.

* A town in the north of present day Algeria (transl.).

Prophet's time,[331] and thus equal to 3.159 litres.

2.2.29 *qafīz*

The oldest reliable report about this dry measure refers to the *qafīz* of Ḥajjāj,* according to which one *qafīz* was equal to one *ṣā'* of the Prophet's time,[332] and thus was equal to 4.2125 litres.

2.2.29.1 'Irāq

In the course of the 10th century, two *qafīz* had emerged in 'Irāq: the bigger *qafīz* measure, namely that of Baghdād and Kūfah, contained 8 *makkūk* at 3 *kaylajah* (per *makkūk*) at 600 *dirham* (per *kaylajah*),[333] and was thus about 45kg (wheat). On the other hand, however, such a *qafīz* amounted to $^1/_4$ *kārah* (see *kārah*) = 240 *raṭl* ÷ 2 = 120 *raṭl* or 48.75kg (wheat). Both statements appear to refer to one and the same measure which we calculate to be 60 litres on the average. The smaller *qafīz* measure, which had been current in Baṣrah and Wāṣiṭ, amounted to 4 *makkūk* at 15 *raṭl* each at 128 *dirham* each,[334] thus corresponding to a weight of 23.962kg of wheat. According to al-Muqaddasī [fl. 10th century],[335] in Mesopotamia and 'Irāq this *qafīz* equalled 30 *mann* and also 60 *raṭl*, but at 130 *dirham*, which resulted in a weight of 24.375kg of wheat. Clearly, the smaller *qafīz* measure proved to be half the size of the bigger one and was thus to be calculated, on the average, at 30 litres.

2.2.29.2 Iran

In Iran, the *qafīz* was in use only during the period of direct Arabic influence since the Iranians preferred weighing to meas-

[331] *Journal Asiatique* 8 VII (1886), p. 417.

* Ḥajjāj b. Yūsuf al-Thaqafi, d. 714, Umayyad governor in 'Irāq (transl.).

[332] Abū Yūsuf, *Kitāb al-Kharāj* (Bulāq-Cairo 1302/1885), p. 31.

[333] Al-Khwārizmi, *Mafātīḥ al-'Ulūm*, ed. G. van Vloten (Leiden 1895), p. 15.

[334] Ibid.

[335] *BGA* III (2) (1906), p. 145.

uring. According to al-Istakhrī [fl. 10th century][336] and Ibn Ḥauqal [fl. 2nd half of 10th century],[337] in Shīrāz one *qafīz* of wheat weighed 16 *raṭl* or 6.5kg, thus measuring 8.44 litres. In Istakhrī, the *qafīz* measured half of this, i.e., 4.22 litres. In Arrajān, the *qafīz* amounted to $^{5}/_{4}$ of that of Shīrāz, i.e., about 10.55 litres, and in Kāzarūn to $^{8}/_{5}$ or about 13.5 litres. In Fasā, the *qafīz* according to both the sources referred to above amounted to $^{9}/_{10}$ of that of Shīrāz, whereas according to al-Muqaddasī [fl. 10th century][338] the *qafīz* contained wheat of a weight of 6 *mann* at 300 *dirham* or 5.6kg which corresponded in both cases to about 7.5 litres. With regard to almonds and barley, the weight was 6 *mann* or 4.87kg, while the weight for rice, peas and lentils was 8 *mann* or 6.5kg. In Nīrīz according to al-Muqaddasī,[339] one *qafīz* amounted to a weight of 3 Baghdādian *raṭl* which for barley, raisins, sultanas or maize resulted in 1.217kg, thus measuring about 1.87 litres. With respect to Marāghah, he[340] mentioned the *qafīz* or *mudd* at 10 *mann* (or 8.112kg) of wheat, whereas he gave for Ahwāz a rate of one *qafīz* = 7 *mann* (5.678kg) or 7.4 litres.[341] In Nayshāpūr during the 10th century, however, one *qafīz* amounted to 70 *mann* or about 56.8kg of wheat,[342] thus corresponding to 74 litres. During the 14th century, the *qafīz* had already been transformed to weight standard and amounted throughout to $^{1}/_{10}$ *jarīb* (see *jarīb*) or about 10kg.[343]

2.2.29.3 Khvārizm

During the 10th century, one *qafīz* equalled $9^{1}/_{2}$ *mann*,[344] and thus

[336] *BGA* I (1870), p. 156.
[337] *BGA* II (1873), p. 215.
[338] *BGA* III (2) (1906), p. 452.
[339] Ibid.
[340] Ibid., p. 381.
[341] Ibid., p. 417.
[342] Al-Khwārizmi, *Mafātīḥ al-'Ulūm*, ed. G. van Vloten (Leiden 1895), p. 67.
[343] *Sa'ādat-Nāmah*, MS Aya Sofya no. 4190, fol. 28b.
[344] Al-Khwārizmi, *Mafātīḥ al-'Ulūm*, ed. G. van Vloten (Leiden 1895), p. 68.

presumably 7.7kg of wheat or 10 litres.

2.2.29.4 Syria, Palestine

According to al-Muqaddasī [fl. 10th century],[345] in Ramlah [in Palestine] one *qafīz* equalled 4 *waybah* or 8 *makkūk* or 24 *kaylajah* at approximately $1^{1}/_{2}$ *ṣā'* each, and was thus equal to 151.4 litres, whereas in 'Ammān* it amounted to $^{1}/_{2}$ *kaylajah*, i.e., about 3.155 litres, and in Ṣūr** it amounted to one *modios*** of Jerusalem, i.e., 77.875kg (wheat) or about 1 hectolitre. During the 12th century in Shayzar,[346] one *qafīz* amounted to 16 *sunbul* at $1\ ^{1}/_{4}$ *raṭl* (per *sunbul*) at 684 *dirham* (per *raṭl*) or about 51.218kg wheat or 66.5 litres. In Ḥāmah and Ḥums,**** one *qafīz* equalled 14 *sunbul*, i.e., 44.816kg or about 58.2 litres.

2.2.29.5 Maghrib

In Qayrawān,[347]***** one *qafīz* equalled 32 *thumn* at 6 *mudd* of the Prophet's time, i.e., 201.877 litres. This was also the case in Tunis around the year 1330, where according to al-'Umarī [d. 1348/49],[348] one *qafīz* consisted of 16 *waybah* at about 12 *mudd* of the Prophet's time each (i.e., 201.877 litres). In Cordova [in Muslim Spain], the *qafīz* consisted of 42 *mudd* of the Prophet's time,[349] thus measuring 44.16 litres.

[345] *BGA* III (2) (1906), p. 181.
* The capital of present day Jordan (transl).
** Tyre, in present day Lebanon (transl.).
*** Known to me is the *modius*, a Roman corn-measure which approximately amounts to a peck or a quarter-bushel (transl.).
[346] Al-Shayzarī, *Book of al-Muḥtasib*, p. 17.
****Two cities in present day Tunisia (transl.).
[347] Al-Muqaddasī, in: *BGA* III (2), p. 240.
***** Kairouan in present day Tunisia (transl.).
[348] In: al-Qalqashandī, *Ṣubḥ*, V, pp. 114–15.
[349] *Journal Asiatique* 8 VIII (1886), p. 282 (H. Sauvaire's annotation).

2.2.30 *qīrāṭ*

An Egyptian dry measure, today equalling $^1/_{32}$ *qadaḥ* (see *qadaḥ*) or 0.064 litre.[350]

2.2.31 *qisṭ*

Measure of capacity (Greek: *xestes*; Latin: *sextarius*) which existed in two sizes: the small *qisṭ*, which corresponded to a weight of 3 *raṭl* of liquid, measuring 1.2158 litres, and the big *qisṭ*, which was exactly double its size, and thus measuring 2.4336 litres.[351] Apparently, one *qisṭ* in Egypt amounted to $^1/_2$ *ṣā'* (see *ṣā'*), thus measuring 2.106 litres.[352]

2.2.32 *rub'*

As a measure of capacity, one *rub'* (variant: *rub'ah*) in Egypt amounted to $^1/_2$ *qadaḥ* (see *qadaḥ*), today officially 0.516 litre.[353] In early Islamic 'Irāq, one *rub' hāshimī* equalled one *ṣā'* of the Prophet's time,[354] and thus 4.2125 litres.

In Andalusia, the expression *rub'* referred to a measure of capacity which weighed, with regard to wine, 18 *raṭl* at 12 *ūqiyah* (per *raṭl*) at 8 *mithqāl* (per *ūqiyah*), thus containing 8.16 litres, i.e., exactly half of the Spanish wine "Arroba" of 16.17 litres.[355]

2.2.33 *ṣā'*

The canonical *ṣā'* consisted of 4 *mudd*. Its exact fixing—of crucial significance for numerous other Islamic measures of

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350 *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 24.

351 Mār Eliyā, in: *Journal Asiatique* 8 VII (1886), p. 442–43.

352 Confer de Sacy, *Traité des poids et mesures de Maqrīzī*, p. 52 (annotation).

353 *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 24.

354 Abū Yūsuf, *Kitāb al-Kharāj* (Bulāq-Cairo 1302/1885), p. 31.

355 Al-Muqaddasī, in: *BGA* III (2), p. 240; *Journal Asiatique* 8 VII (1886), p. 171.

capacity—had been made possible by a report which was preserved by a lucky coincidence from the Ayyūbid* period, namely from the year 1195: according to this report a gauge vessel of one *mudd*, of a capacity of 337 *dirham* of water,[356] equalled 1.053125kg/ litre. One *ṣā'* of the Prophet's time, therefore, measured exactly 4.2125 litres. If we convert this measure into the weight for wheat (1 hl = 77kg) we arrive at 3.24kg. The canonic traditionists mention a weight of sometimes $5^1/_3$ *raṭl* and sometimes 8 *raṭl* for the *ṣā'*.[357] Despite this apparent contradiction, the solution seems to lie in the fact that the said $5^1/_3$ *raṭl* was Medinan and corresponded to 8 *raṭl* of Baghdād, agreeing in both cases with 3.245kg of wheat. Therefore, both these values lead exactly to the figure of 4.2 litres calculated by us.

2.2.34 *ṣaḥfah*

A Maghribine measure of capacity, measured in Ténès** 48 *qādūs* at 3 *mudd* of the Prophet's time, i.e., 151.4 litres; in Nakūr it equalled 25 *mudd* of the Prophet's time; in Fez, until the year 1294, 40 local *ṣā'* amounted to 50 *ṣā'* of the Prophet's time, i.e., 210.28 litres. After the year 1294, the *ṣaḥfah* of Fez amounted to 40 *ṣā'* of the Prophet's time or 168.23 litres.[358***]

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* A dynasty which ruled in Egypt 1171–1252, with branches in Syria and Yemen (transl.).

356 *Journal Asiatique* 8 III (1884), p. 442.

357 Supporting evidences to be found in H. Sauvaire, in: *Journal Asiatique* 8 III (1886), pp. 394–417. Refer also to al-Khwārizmi, *Mafātīḥ al-'Ulūm*, ed. G. van Vloten (Leiden 1895), p. 14.

** A town in the north of present day Algeria (transl.).

358 Supporting evidences to be found in H. Sauvaire, in: *Journal Asiatique* 8 VII (1886), pp. 417–18 (conversion rate, however, by Walther Hinz).

*** Hinz adds in the 'Anhang' (appendix) to the German original based on information provided to him by T. Lewicki: according to al-'Umarī (*Masālik al-Abṣār*, ed. Paris 1927, p. 101 and note 1 therein), one *ṣaḥfah* consisted of 12 Ḥafsid *mudd*, i.e., probably 51.84 litres. Moreover, there existed in the Maghrib also a measure of capacity called *ṣaḥfah* which consisted of 10 *ṣaḥfah*. The Ḥafsid ruled over Tunisia and eastern Algeria between 1228 and 1574 (transl.).

2.2.35 *sunbul*

A Syrian dry measure, in Shayzar[359] comprising $1^1/_2$ *raṭl* at 684 *dirham*, i.e., 3.206kg (wheat) or about 4.16 litres.

2.2.36 *sunqurī*[*]

The *sunqurī*, a corn-measure of Zabīd, corresponded to 240 *dirham*, i.e., apparently 792g.[360]

2.2.37 *taghār*

An Iranian "pack animal's load" [Hinz: "Saumlast"], since the year 1300, standardised at 100 *mann* of Tabrīz at 250 *dirham* each,[361] thus equal to 83.4kg. As a dry-measure it existed in various sizes (depending on the kind of grain) since the weight had to be always 100 *mann*.

2.2.38 *thumn*

In Egypt equal to $^1/_8$ *qadaḥ* (look up there), today 0.258 litre; in Qayrawān[**] amounting to 6 *mudd* during the Prophet's time (see *qafīz*), or 6.318 litres.

2.2.39 *tillīs*

According to al-Muqaddasī [fl. 10th century]. this Egyptian dry measure equalled 8 *waybah* of the weight of 15 Baghdādian *mann* (per *waybah*),[362] i.e., 97.5kg of wheat; however, it is said to have

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359 Al-Shayzarī, *Book of al-Muḥtasib*, p. 17.

* This entry has been added to the English translation from the appendix ("Anhang") to Hinz's German original text, see there, p. 67] (transl.).

360 Confer al-Khazrajī, *'Uqūd*, vol. II, p. 159, quoted by O. Löfgren, loc. cit., vol. II, 2, 1950, p. 37.

361 Rashīd al-Dīn, ed. K. Jahn (Gibb Memorial), p. 290.

** Kairoun in present-day Tunisia (transl.).

362 *BGA* III (2), p. 204.

been already obsolete by then. This oldest *tillīs* thus measured about 127 litres. During the High Middle Ages, one *tillīs* amounted to 150 Egyptian *raṭl*,[363] i.e., 67kg (wheat) or about 87.7 litres and thus came close to the *irdabb* of Cairo. During the 19th century, one *tillīs* amounted to about 225kg or about 3 hl.[364] As a Turkish dry measure, one *tillīs* amounted to $^1/_3$ *kīle* or $^1/_{80}$ *müdd*[365] and thus corresponded to a weight of 6.41kg (wheat) and a capacity of 8.32 litres.

2.2.40 *wasq*

During the early Islamic period, one *wasq* or "camel load" consisted of 60 *ṣā'*,[366] and thus equalled 252.3456 litres (or 194.3kg, with regard to wheat). At the time of the 'Abbāsid caliph Hārūn al-Rashīd [r. 786–809], one *wasq* amounted to $2^1/_2$ *wasq* of the Prophet's time, thus 630.864 litres or about 485.765kg (wheat).[367] In later times, however, the sources refer again throughout to 60 *ṣā'* of the Prophet being equal to one *wasq*.[368]

2.2.41 *waybah*

A principally Egyptian dry measure, during the early Islamic period equalled 10 *mann*[369] or 12.168kg (wheat), during the 14th

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363 *Journal Asiatique* 8 III (1884), p. 419.

364 According to a note by Girard, referred to by H. Sauvaire (in: *Journal Asiatique* 8 VII (1886), p. 154). It is, however, remarkable that the veracious observer E. W. Lane did not mention (around the year 1830) the *tillīs*, but only the *irdabb*.

365 To be calculated in accordance with a Turkish *kanunâme-i ihtisâb* from the year 1501, published in *Tarih Vesikaları* I, p. 330.

366 Abū Yūsuf, *Kitāb al-Kharāj* (Bulāq-Cairo 1302/1885), p. 30.

367 Ibid., p. 31.

368 For instance, al-Khwārizmi, *Mafātīḥ al-'Ulūm*, ed. G. van Vloten (Leiden 1895), p. 14, al-Māwardī, ed. Enger, p. 203, S. de Sacy, *Traité des poids et des mesures légales des Musulmanes, traduit de l'arabe de Makrizi* (Paris, an vii), p. 50–51.

369 Al-Muqaddasī, in: *BGA* III (2), p. 204.

and 15th centuries comprising 16 *qadaḥ* (see *qadaḥ*) at 232 *dirham* (per *qadaḥ*) or 11.6kg (wheat), i.e., practically 15 litres. Around the year 1665, however, Gonsales[370] refers to one *waybah* of rice at 8 *qadaḥ* at 3 *raṭl kabīr*, i.e., 1.5kg, which would result in 12kg of rice or a capacity of only 12.5 litres for the *waybah*. During the 19th century, one *waybah* equalled 33 litres.[371] This measurement, however, is Ottoman as indicated by the adjustment of the *irdabb* to the *weight* of 100 *oqqa* wheat. This *waybah* corresponded thus to $^5/_6$ Ottoman kīle or 21.367kg wheat. In Ramlah,* one waybah equalled $^1/_4$ qafīz (see qafīz), and thus equal to about 37.8 litres.[372] In Tunis around the year 1330, one waybah equalled about 12 mudd of the Prophet's time,[373] and was thus equal to about 12.6 litres.

3. Linear Measures

3.1 *angusht*

[A Persian expression, a "fingerbreadth", literally "finger"]. See *aṣba'*.

3.2 *arash*

The Persian term for "cubit" [Hinz: "Elle"] (see also under *gaz* and *ẓar'*), rarely used. According to Nāṣir-i Khusrau [1004–before 1078],[374] one *gaz-i malik* or "royal cubit" amounted to slightly less than $1^1/_2$ *arash*. This "royal cubit" has been calculated (see entry *gaz*) fairly accurately at 95cm. Accordingly, one arash should be estimated at about 64cm.**

370 Hiervsalemsche Reyse, II. Deel (Antwerp 1673), p. 84.

371 Mahmoud Bey, in: *Journal Asiatique* 7 I (1873), p. 85.

* A town in Palestine (transl.).

372 Al-Muqaddasī, in: *BGA* III (2), p. 181.

373 According to al-'Umarī, in: al-Qalqashandī, Ṣubḥ, V, p. 114–15.

374 Nāṣir-i Khusraw, ed. Charles Schefer (Paris 1881), pp. 22 and 72, respectively.

** Hinz adds in the 'Anhang' (appendix) to the German original: "A more exact calculation had been provided by Nāṣir-i Khusrau himself at another place (p.40 of the Persian edition), where he calculated the length of one side of the octagonal Dome of the Rock in Jerusalem at 13 *arash* (or *gaz*). Since in reality one side measures 20.4m (confer R. Hartmann, *Der Felsendom in Jerusalem*, Straßburg 1909, p. 13), the result for one *arash* during the high Middle Ages would have been 62cm" (transl.).

3.3 *aṣba'*

The "finger-breadth" amounted principally to $^1/_{24}$ of the "cubit" (look up under *dhirā'*) and fluctuated therefore in accordance with the latter.* In Islamic metrology, however, two measures predominated: the *aṣba'* of the canonic "cubit" (i.e., 49.875 ÷ 24 = 2.078cm) and the *aṣba'* of the so-called "black cubit" (i.e., 54.04 ÷ 24 = 2.252cm). In Egypt today, the *aṣba'* amounts to 3.125cm.[375]

Toward the end of the 16th century, the Mughal emperor Akbar [r. 1556–1605] subdivided the "cubit" into 41 *angusht* at 2.032cm each. This measure for the "finger-breadth" was even maintained when the old "royal" cubit was in the year 1647 standardized again at 40 *angusht*.[376]

3.4 *ashl*

The *ashl*, literally "chain" or "rope", amounted to a length of 60 *hāshimī* "cubits",[377] thus, according to my own calculations (see below under *al-dhirā' al-hāshimiyyah*), 39.9 metres.

* Hinz adds in the 'Anhang' (appendix) to the German original: "The "finger-breath" (*aṣba'*) equalled canonically 6 *sha'īrah* ("barley seeds") or $^1/_{24}$ "cubit" (transl.).

375 *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 22.

376 W. H. Moreland, "The Mogul unit of measurement", in: *Journal of the Royal Asiatic Society* (1927), p. 102.

377 *Journal Asiatique* 8 VIII (1886), p. 481; *Ta'rīkh-i Qumm* (Theran 131/1934), p. 109.

3.5 *bā'*

The *bā'* or "fathom" [Hinz: "Klafter"], also called *qāmah* by the Arabs, corresponded principally to 4 canonic "cubits" (see below under *al-dhirā' al-shar'iyyah*), and thus equalled 199.5cm or around 2 metres, amounting to $^1/_{1000}$ *mīl* or "mile".[378] In present-day Egypt, the *bā'* equals 4 "carpenter's cubits" [Hinz: "Zimmermannsellen"], i.e., 3 metres.[379]

3.6 *bāb*

This linear measure (literally meaning "a rod") amounted to $^1/_{10}$ *ashl*,[380] and thus (during the Middle Ages) to 3.99 metres.

3.6 *bahr*

An Iranian linear measure. 32 *bahr* amounted to one "cubit" of modern times *(ẓar')* at 104 cm, and thus was corresponding to 3.25cm.[381]

3.7 *barīd*

The *barīd* (from Latin *veredus*) equalled 2 *farsakh*, and corresponded thus to about 24km.[382]

3.8 *dhirā'*

The number of Islamic "cubit" measures was considerable. The starting point for all calculations is the "cubit" of the old Nilometre on the Nile island of al-Rauḍah from the year 861. According to the investigations of the French expedition under

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[378] Confer Reinauld, *Traduction d'Abou'l-Féda*, pp. cclxv and 18.

[379] *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 22.

[380] *Journal Asiatique* 8 VIII (1886), pp. 482–83.

[381] G. H. Ebtehaj, *Guide Book on Iran*, 2nd ed. (Tehran, n. d., c. 1936), p. 78.

[382] *Journal Asiatique* 8 VIII (1886), pp. 484–85.

Napoleon Bonaparte and their reconsideration by K. A. C. Creswell in the year 1927,[383] this "cubit" amounted on the average to exactly 54.04cm. This is the so-called "black cubit" of the 'Abbāsid period. In the following we present the individual "cubit" measures in alphabetical order. With regard to Iran, the reader is referred to the entries *gaz* and *ẓar'*.

3.8.1 *dhirā' al-'amal*

The Egyptian "practical cubit" corresponded to the *hāshimī* "cubit".[384] The latter measured according to our own calculations (see *al-dhirā' al-hāshimiyyah*) on the average, 66.5cm.[385]

3.8.2 *al-dhirā' al-'āmmah*

The "ordinary cubit" was probably equal to the "black cubit" at 54.04cm. It is true that Gonsales referred in the year 1665 to an "ordinary" quarter "cubit" in a drawing at 13.2cm, which would imply 52.8cm for such a "cubit".[386] However, the slight difference could have been the result of inexact reproduction in the printed version.

3.8.3 *al-dhirā' al-baladiyyah*

According to measurements from the 19th century, the normal length of this "cubit" was 58.26cm,[387] thus corresponding to the "pik", i.e., the "cloth cubit" [Hinz: "Tuchelle"] of Cairo (*dhirā'*

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[383] *Early Muslim Architecture*, vol. II (Oxford 1940), p. 290 ff.

[384] Al-Maqrīzī, referred to by H. Sauvaire, in: *Journal Asiatique* 8 VIII (1886), pp. 508.

[385] This seems to correspond to al-Maqrīzī's note (loc. cit.) with regard to the 'Amr-Mosque in al-Fusṭāṭ, which is said to have covered an area of 28,000 square-*dhirā' al-'amal*. This would, according to out own calculations, also amount to 12,457.5m2 (K. A. C. Creswell, loc. cit., vol. II, p. 191).

[386] *Hiervsalemsche Reyse, II. Deel* (Antwerp 1673), to face p. 84.

[387] According to Mahmoud Bey, "Le système métrique actuel d'Egypte", in: *Journal Asiatique* 7 I (1873), p. 73.

al-bazz, see below). E. W. Lane referred to it as a "cloth cubit" of 22 $^{2}/_{3}$ inches,[388] which would correspond to a mere 57.57cm.

3.8.4 *dhirā' al-barīd*

The "post cubit" was identical with the canonic "cubit" of 49.875cm.[389]

3.8.5 *dhirā' al-bazz*

During the Middle Ages, the "cloth cubit" was, as could be expected, one of the most common kinds of "cubits" and was principally known as "pik" in Levantine trade. Its length varied from city to city.

3.8.5.1 Cairo

According to al-Qalqashandī [1355–1418],[390] the Egyptian "cloth cubit" equalled one "hand cubit" + 4 *aṣba'*, and thus $1^{1}/_{6}$ "hand-cubits". If we assume for the latter a value of 49.875cm (see below under *dhirā' al-yad*) we arrive at 58.187cm for the "cloth-cubit" of Cairo. This figure has been confirmed most accurately by a statement of Da Uzzano[391] from circa 1440, according to which, "picchi 114 d'Alessandria sone di Vinegia braccia 97", which results for the "pik" in 58.15cm (since one Venetian "cubit" corresponds to 68.34cm). The "cloth cubit" of Alexandria was thus of the same length as the one of Cairo.

Gonsales[392] refers in a drawing circa 1665 to a quarter

388 E. W. Lane, *An Account of the Manners and Customs of the Modern Egyptians*, vol. II (London 1836), p. 370.

389 To be calculated from Ibn Taghri Birdī, ed. W. Popper, vol. VIII, p. 475, according to which 5,648 "and a fracture" *dhirā' al-ḥadīd* (look up there) amounted to 6,589 $^{2}/_{3}$ "post-cubits".

390 Al-Qalqashandī, *Ṣubḥ*, III, p. 447.

391 *La pratica mercatura*, p. 113.

392 *Hiervsalemsche Reyse, II. Deel* (Antwerp 1673), to face p. 84.

"cubit" at 14.5cm, which results again in 58cm for the "cubit". He added, however, that only cloth from India used to be measured in it, whereas foreign cloth were measured according to the "cubit" of İstanbul, which, according to his drawing, was to be calculated at 64.4cm (correctly at 68.579cm).

3.8.5.2 Damascus

The Damascene "cloth cubit" was, according to al-Qalqashandī [1355–1418],[393] $^{1}/_{12}$ longer than that of Cairo and is thus to be calculated at 63.035cm.

3.8.5.3 Aleppo

The "cloth cubit" of Aleppo was, according to al-Qalqashandī [1355–1418],[394] about $^{1}/_{6}$ longer than the one of Cairo and is thus to be calculated at 67.9cm. This has been confirmed accurately by W. Barrett,[395] who in the year 1584 gave the rate: 100 "pikes" of Aleppo = 103 "codes" of Hormūz. Since one Portuguese *codo* of Hormūz measured 66cm,[396] the result with regard to the "cloth cubit" of Aleppo was 67.98cm. During the 19th century one "pik" amounted to 67.7cm in Aleppo.[397]

3.8.5.4 Tripoli

In Tripoli,* the "cloth cubit" amounted to $^{11}/_{10}$ of the one in Cairo[398] and thus measured 64cm.

393 Al-Qalqashandī, *Ṣubḥ*, IV, p. 181.

394 Ibid., p. 216.

395 *The Money and Measures of Babylon*, in: Hakluyt, *Extra Series* VI, p. 15.

396 L. C. Bleibtreu, *Handbuch der Münz-, Mass- und Gewichtskunde* (Stuttgart 1863), p. 215.

397 Ibid., 489.

* A city in present day Lebanon (transl.)

398 Al-Qalqashandī, *Ṣubḥ*, IV, p. 233.

3.8.5.5 Jerusalem

During the 19th century, the "cloth-cubit" in Jerusalem amounted to 25 1/2 inches,[399] or 64.77cm.

3.8.5.6 'Irāq

During the 16th century, the "cloth cubit" measured 82.9cm in Baghdād as well as in Baṣrah. This has been calculated from the statements of Barrett,[400] according to whom 82 "pikes" of "Babylon" (i.e., Baghdād) amounted to 100 "pikes" of Aleppo. According to him, 100 Baghdādian "pikes" equalled also 125 2/3 "codes" of Hormūz at 66cm each. In the 19th century, Bleibtreu[401] referred to the Baghdādian "cloth cubit" as corresponding to 80.26cm.

3.8.5.7 Iran

See *gaz* and *zar'*.

3.8.5.8 India

In the international trade with India (as well as in medieval Iran) the "cloth cubit" of Aleppo prevailed. In Surat [a harbour on the western coast of India], there existed during the 17th century a smaller "cubit" at 27 inches, i.e., 68cm (which was thus equivalent to that of Aleppo) and a bigger one at 36 inches or 91cm.[402]

3.8.6 *al-dhirā' al-bilāliyyah*

The name of this "cubit" can be traced to Bilāl b. Abī Burdah (d. 739) who was a judge *(qāḍī)* in Baṣrah. This "cubit" was also called "small *hāshimī*-cubit" and was around 2 2/3 *aṣba'* longer than the "black cubit", thus measuring 60.055cm.[403]

399 T. Tobler, *Denkblätter aus Jerusalem* (St. Gallen and Constance 1853), p. 279.
400 Hakluyt, *Extra Series* VI, p. 15.
401 Loc. cit., p. 490.
402 J. Fryer, *A New Account of East-India and Persia* (London 1698), p. 206.

3.8.7 *dhirā' al-dūr*

The "cubit of the houses", also called *fiḍḍiyyah* and supposedly introduced by the *qāḍī* Ibn Abī Laylah Yasār of Kūfah (d. 765), was around 1 2/3 *aṣba'* smaller than the "black cubit", thus measuring 50.3cm.[404]

3.8.8 *dhirā' al-ḥadīd*

During the 15th century in Egypt and the Ḥijāz, the "iron cubit" at 28 canonic *aṣba'* served as "cloth-cubit" and amounted to 7/6 of the "hand cubit" (see *dhirā' al-yad*),[405] thus measuring 58.187cm, exactly the same as that calculated for the "cloth cubits" of Cairo and Alexandria (see *dhirā' al-bazz*).

3.8.9 *al-dhirā' al-hāshimiyyah*

The (big) *hāshimī* "cubit" at 8 *qabḍah* or 32 *aṣba'* was equal to the "royal" or *ziyādī* "cubit" *aṣba'*. It was supposedly known under the name *hāshimī* "cubit" since the time of the 'Abbāsid Caliph al-Manṣūr (r. 754–75). This "cubit" was around 7 2/3 *aṣba'* (finger-breadths) longer[406] than the above "cubit of the houses" which has been calculated at 50.3cm. If we assume a "finger-breadth" to be 2.078cm, the *hāshimī* "cubit" is to be calculated at 66.27cm. Since we have calculated the "royal cubit" at 66.81cm and 66.21cm (see below under *dhirā' al-malik*), respectively, we

403 Al-Māwardī, [quoted by Hinz from:] Maximilian Enger (ed.), *Maverdii Constitutiones politicae, ex recensione* (Bonn 1853), p. 266.
404 *Journal Asiatique* 8 VIII (1886), p. 491.
405 *Auszüge aus den Geschichtsbüchern der Stadt Mekka von Muhammed el-Fâsí*, ed. by F. Wüstenfeld (Leipzig 1859), pp. 68–69 and 590.

estimate, thus, the average figure 66.5cm for the *hāshimī* "cubit". The small *hāshimī*-"cubit" was equal to the "Bilāl cubit" [see *al-dhirā' al-bilāliyyah*, above], i.e., 60.055cm.

3.8.10 *dhirā' al-hindāsah*

E. W. Lane[407] ascribed to this "cubit", which was used merely for measuring Indian cloth, a value of about 63.5cm. Today, this Egyptian linear measure amounts to exactly 65.6cm.[408] Probably, this refers to the old *hāshimī* "cubit".

3.8.11 *al-dhirā' al-Istanbūliyyah*

This "cubit", actually being the "cloth-cubit" of İstanbul, has been used in modern times in Egypt for measuring European clothes. E. W. Lane[409] calculated it at circa (c.) 26 $^1/_2$ inches = c. 67.3cm. According to Bleibtreu[410] during the 19th century, it measured 68.579cm. It was introduced [officially] in Cairo in November 1920.[411]

3.8.12 *dhirā' al-kirbash*

This Egyptian "cubit" for measuring white sacking [Hinz: "Sackleinwand"] equalled the "ordinary cubit" (*al-dhirā' al-'āmmah*),[412] whereas the "ordinary cubit", in turn, equalled, as already mentioned, the "black cubit" (*al-dhirā' al-saudā'*) at 54.04cm.

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406 *Journal Asiatique* 8 VIII (1886), p. 495.
407 E. W. Lane, *An Account of the Manners and Customs of the Modern Egyptians*, vol. II (London 1836), p. 370.
408 Mahmoud Bey, in: *Journal Asiatique* 7 I (1873), p. 100, and *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 22.
409 Loc. cit., p. 371.
410 Loc. cit., p. 493.
411 Abū Iyās, ed. Paul Kahle, V (Istanbul 1932), p. 410.
412 *Journal Asiatique* 8 VIII (1886), p. 508.

3.8.13 *dhirā' al-malik*

The "royal cubit" equalled the big *hāshimī* "cubit", whose name it had assumed during the time of the 'Abbāsid Caliph al-Manṣūr (r. 754–75). The "royal cubit" was around 5 $^2/_3$ *aṣba'* (finger-breadths) longer than the "black cubit" of 54.04cm. According to another statement from the same source,[413] it amounted to 1 $^9/_{40}$ of the "black cubit". In the first case the "royal cubit" (i.e., the finger-breadth at 2.252cm) was to be calculated at 66.81cm, in the second at 66.21cm. As a practical average figure, we propose, therefore, 66.5cm.

3.8.14 *al-dhirā' al-mi'māriyyah*

The "construction cubit" [Hinz: "Bauelle"] equalled the Egyptian "carpenter's cubit" [Hinz: "Zimmermannselle"] (*al-dhirā' bi'l-najjārī*). During the Middle Ages, it amounted to $^8/_5$ "hand cubits".[414] The *dhirā' al-yad* (see *dhirā' al-yad*, below) has been calculated by us at 49.875cm, which resulted in 79.8cm for the medieval "construction cubit". In the 19th century, Mahmoud Bey calculated the "hand cubit" on the average at 49.32cm.[415] This resulted in a "carpenter's cubit" being 78.9cm. This figure of 78.9cm, however, appears to be slightly too high with regard to other equations (see *qaṣabah*). it, therefore, follows that the "carpenter's cubit" was to be calculated at 77.5cm. During the second half of the 19th century, the Egyptian "carpenter's cubit" was standardised at 75cm,[416] apparently in order to adjust it to the metric system.

3.8.15 *dhirā' al-misāḥah*

The "survey cubit" [Hinz: "Vermessungselle"] equalled, appar-

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413 Al-Māwardī, ed. M. Enger, p. 266.
414 Al-Qalqashandī, *Ṣubḥ*, III, p. 446.
415 Mahmoud Bey, in: *Journal Asiatique* 7 I (1873), p. 106.
416 Ibid., p. 109.

ently, the "royal cubit" (*dhirā' al-malik*) at 66.5cm.[417]

3.8.16 *al-dhirā' al-mīzāniyyah*

The "scales cubit" [Hinz: "Waage-Elle"], introduced by the 'Abbāsid Caliph al-Ma'mūn (r. 813–33), amounted to 2 $^{2}/_{3}$ "black cubits" + $^{2}/_{3}$ *aṣba'* (finger-breadths) and was mainly used for measuring canals.[418] According to the above calculations, it amounted to 145.63cm.

3.8.17 *al-dhirā' al-mursalah*

Literally a "loosened cubit" of which 12,000 amounted to a *farsakh* (see *farsakh*). Without any doubt, this "cubit" was identical to the canonic or "hand cubit" (see *dhirā' al-yad*) at 49.875cm according to my own calculations.

3.8.18 *al-dhirā' bi'l-najjārī*

The Egyptian "carpenter's cubit", on the average, amounted to 77.5cm (see also *al-dhirā' al-mi'māriyyah*).

3.8.19 *al-dhirā' al-qā'imah*

This "cubit" was identical to the canonic or "hand cubit" (see *dhirā' al-yad*) at 48.875cm, which is derived from the fact that 80 of these "cubits" equalled 60 *hāshimī* "cubits".[419] The latter has been calculated at 66.5cm.

3.8.20 *al-dhirā' al-rashshāshiyyah*

The *rashshāshī* "cubit" at 6 *qabḍah* (see *qabḍah*) was predominantly current in Maghrib and Muslim Spain and equalled exactly the "black cubit" (*al-dhirā' al-saudā'*),[420] measuring thus 54.04cm.

417 *Journal Asiatique* 8 VIII (1886), p. 508.
418 Ibid., p. 496, and al-Māwardī, ed. M. Enger, p. 267.
419 *Journal Asiatique* 8 VIII (1886), p. 482.

3.8.21 *al-dhirā' al-saudā'*

The so-called "black cubit" was introduced under the 'Abbāsid Caliph al-Ma'mūn (r. 813–33) and amounted to 24 *aṣba'* (finger-breadths) and measured 54.04cm, according to the Nilometre on the island of al-Rauḍah.[421]

3.8.22 *al-dhirā' al-shar'iyyah*

The canonic "cubit" was identical to the Egyptian "hand cubit" (see *dhirā' al-yad*) and measured, according to my own calculations, 49.875cm.[422]

3.8.23 *al-dhirā' al-'umariyyah*

The "cubit" of the caliph 'Umar [r. 634–44], amounted to half of the "scales cubit",[423] i.e., according to my own calculations, to 72.815cm.

3.8.24 *dhirā' al-yad*

The Egyptian "hand cubit" was, as just mentioned, identical with the canonic "cubit" and 1 $^{2}/_{3}$ *aṣba'* (finger-breadths) smaller than the "black cubit" at 54.04cm (see *al-dhirā' al-saudā'*) or corre-

420 Ibid., p. 500.
421 Compare with what has been stated by us above under the entry *dhirā'*, and refer also to al-Muqaddasī, in: *BGA* III (2), pp. 65–66 and al-Mas'ūdī, *Prairies d'or*, vol. I, p. 183.
422 *Cuṭb ed-Dîn's Geschichte der Stadt Mekka*, ed. F. Wüstenfeld (Leipzig 1857), p. 15.
423 *Journal Asiatique* 8 VIII (1886), p. 496.

sponding to $^1/_3$ "scales cubits" (see *al-dhirā' al-mīzāniyyah*).[424] In the first case the "hand cubit" was to be calculated at 50.3cm (since one *aṣba'* equalled 2.252cm), in the second case at 48.54cm. The length of the "hand cubit" can be ascertained more precisely by a statement of al-Qalqashandī [1355–1418],[425] according to which it consisted of 6 *qabḍah* (hand-breadths) at 4 *aba'* (finger-breadths) or 2.078cm (per *qabḍah*), and 8 of such "cubits" amounted to 6 *hāshimī* "cubits" (see *al-dhirā' al-hāshimiyyah*). The result for the *dhirā' al-yad* is therefore 49.875cm. During the 19th century, the "hand cubit" had been calculated by Mahmoud Bey, on the average, at 49.32cm.[426]

3.8.25 *al-dhirā' al-yūsufiyyah*

This "cubit", named after the well-known *qāḍī* Abū Yūsuf (d. 798), was $^2/_3$ "finger-breadths" shorter than the "black cubit",[427] thus amounting to 52.55cm. This, however, could be the result of incorrect transmission of data. According to a better attested statement,[428] the *yūsufī* "cubit" was $^2/_{21}$ shorter than the "black cubit", which would make it 48.9cm. Most probably the *yūsufī* "cubit" was identical to the canonic or "hand cubit" at 49.875cm (according to our own calculations).

3.8.26 *al-dhirā' al-ziyādiyyah*

A "cubit" of the early Islamic period which had been applied by Ziyād b. Sumayyah (d. 673 in Kūfah) for surveying 'Irāq. It was identical to the "royal cubit" (*dhirā' al-malik*) or the big *hāshimī* "cubit",[429] and thus, according to our own calculations, equal to 6.5cm.

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424 Ibid., pp. 495 and 497.
425 Al-Qalqashandī, *Ṣubḥ*, III, p. 446.
426 *Journal Asiatique* 7 I (1873), p. 106.
427 Al-Māwardī, in: *Journal Asiatique* 8 VIII (1886), p. 491.
428 Al-Rāzī, in: *Journal Asiatique* 8 VIII (1886), p. 497.
429 Al-Māwardī, ed. M. Enger, p. 266.

3.9 *farsakh*

The *farsakh* [Hinz: "Parasange"] consisted of 3 "miles", at 1,000 *bā'* or "fathoms" [Hinz: "Klafter"] (per "mile"), at 4 canonic "cubits" (see *al-dhirā' al-shar'iyyah*, above) (per "fathom"),[430] measuring thus about 6 km.

3.10 *gaz*

Gaz is the Persian term for the "cubit", for which the terms *ẓar'* and *ẓirā'* (see *ẓar'* and *ẓirā*) are also often used. Ascertaining these is somehow difficult.* During the High Middle Ages, one *gaz-i shāhī* amounted, according to Chardin [1643–1713, French traveler to Iran],[431] to 3 "pieds moins une pouce", i.e., 94.745cm, and, according to Fryer[432] [d. 1733, English traveler to India and Iran], to 37 $^1/_2$ inches, i.e., 95.15cm, and thus, on the average, to 95cm. One *gaz* amounted still to 94cm during the 19th century in Baṣrah.[433]

Apart from the *gaz-i shāhī*, there existed also a *gaz-i mukassar* or "shortened cubit" for measuring carpets, silk and fine textiles. According to Chardin, it amounted to $^2/_3$ of the "royal *gaz*" or, according to his calculations, to 63.12cm. According to Fryer, it amounted to 27 inches, i.e., 68.58cm. The latter appears to be more probable since this could be referring to the "cloth cubit" of Aleppo, which we have calculated at 68cm.

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430 E. Wiedemann, "Beiträge zur Geschichte der Naturwissenschaften XXII", in: *Sitzungsberichte der Physikalisch-Medizinischen Sozietät in Erlangen*, vol. IV (Erlangen 1911), p. 308 n. 3.

* [Hinz adds in the 'Anhang' (appendix) to the German original: "During the High Middle Ages, one *ga* amounted to 62cm, as mentioned above (under the entry for *arash*)." (transl.)

431 *Voyages*, ed, Langlès,vol IV (Paris 1811), p. 176.
432 *A New Account of East-India and Persia* (London 1698), p. 211.
433 L. C. Bleubtreu, *Handbuch der Münz -, Mass- und Gewichtskunde* (Stuttgart 1863), p. 57.

Today, there exists in Iran only *one* kind of *gaz*, namely that at 104cm.[434]

3.11 *gereh*

A Persian linear measure, amounting to $^1/_{16}$ *ẓar'* (see *ẓar'*; referring to one *ẓar'* at 104cm). One *gereh* was equal to 2 *bahr*, thus amounting to 6.5cm.[435]

3.12 *ḥabl*

This measure, literally meaning "rope", amounted to 40 *rashshāshī* "cubits"[436] at 54.04cm (per *rashshāshī* "cubit"), i.e., 21.616 metres, in western Andalusia.

3.13 *khuṭwah**

A linear measure, corresponding to 3 spans [Hinz: "Spannen"] (according to Ibn Jubayr, *Travels*, ed. W. Wright, Leiden 1907, 2nd edition, p. 30).

3.14 *mīl*

The "mile" amounted to 4,000 canonic "cubits", or $^1/_3$ *farsakh* (see *farsakh*), i.e., about 2 km.[437]

3.15 *qabḍah*

The *qabḍah* or "first-breadth" at usually 4 *aṣba'* or "finger-breadths" generally equalled $^1/_6$ "cubits" during the Middle

[434] G. H. Ebtehaj, *Guide Book on Iran*, 2nd ed. (Tehran, n. d., c. 1936), p. 78.
[435] Ibid.
[436] *Journal Asiatique* 8 VIII (1886), pp. 488–98.
* [Translator's note: This entry has been added to the English translation from the appendix ("Anhang") to Hinz's German original text, see there, p. 68].
[437] Al-Muqaddasī, in: *BGA* III (2), p. 65.

Ages,[438] but fluctuated, depending on the measure for the "cubit". With regard to the "ordinary" ("black") "cubit" the *qabḍah* amounted, therefore, to 9cm, and with regard to the canonic "cubit", to 8.31cm. During the 19th century, the *qabḍah* amounted to abut $6^1/_4$ inches[439] or about 15.875cm in Egypt.

3.16 *qāmah*

See *bā'*.

3.17 *qaṣabah*

With regard to the so-called *ḥākimī* "rod" [Hinz: "Rute"], named after the Fāṭimid caliph al-Ḥākim bi-Amr Allāh [r. 996–1021], there existed the following equations: one *qaṣabah* = *6 hāshimī*-"cubits", one *qaṣabah* = 5 "carpenter's cubits" = 8 "hand cubits", or one *qaṣabah* = $6\ ^2/_3$ "cloth cubits", or one *qaṣabah* = $7\ ^1/_7$ "black cubits".[440] From this supporting evidence, 3.99 metres emerges as an average-figure for the *qaṣabah*. This figure of 3.99 metres, however, applied only up to the year 1830. Thereafter, the *qaṣabah* amounted merely to 22 *qabḍah*,[441] instead of 24 *qabḍah* previously, thus, up to the present, to 3.55 metres[442] In addition to this, there exists in Egypt today also a second, totally different, linear measure, namely the *qaṣabah* at $^1/_6$ "carpenter's cubits", which is officially 12.5cm.[443]

[438] Confer *Journal Asiatique* 8 VIII (1886), p. 525.
[439] According to E. W. Lane, *An Account of the Manners and Customs of the Modern Egyptians*, vol. II (London 1836), p. 371.
[440] Al-Qalqashandī, *Ṣubḥ*, III, p. 446; al-Bakrī, *Notices et extraits* I, p. 269; *Journal Asiatique* 8 VIII (1886), pp. 518 and 527, respectively.
[441] E. W. Lane, *An Account of the Manners and Customs of the Modern Egyptians*, vol. II (London 1836), p. 371.
[442] *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 22.
[443] Ibid.

3.18 *ṭanāb*

This Persian linear measure, literally meaning "rope", is identical to the Arab *ashl* (see *ashl*), as can be deduced from a Persian chronicle from the 17th century.[444] Accordingly, 80 *ẓar'-i shar'ī* or canonic "cubits" at 49.875cm amounted to one *ṭanāb*, which is, therefore (like one *ashl*), to be calculated at 39.9 metres. 150 *ṭanāb* amounted to one *farsakh*.

3.19 *ẓar'* [from Arabic *dhar'*]

Principally, a term applying to the Persian "cubit" (also called *gaz*, or more rarely *ẓirā'*). The two most important *ẓar'*- measures are the canonic "cubit", or *ẓar'-i shar'ī*, and the "cubit" of Iṣfahān. Both measures can be ascertained clearly from the Persian chronicle-note referred to in the previous entry, according to which 7,500 "cubits" of Iṣfahān or 12,000 canonic "cubits" amounted to one *farsakh*. Therefore, one *ẓar'-i shar'ī* (identical to one Arabic canonic "cubit"; see *al-dhirā' al shar'iyyah*) amounted to 49.875cm. Correspondingly, one *ẓar'-i Iṣfahān* equalled $^{8}/_{5}$ *ẓar'-i shar'ī* or 79.5cm. This "cubit" of Iṣfahān had been calculated by Sparr de Homberg around the year 1681 at 1 $^{3}/_{16}$ "aunes d'Holland",[445] which resulted in 81.63cm and was, therefore, not accurate.

3.20 *ẓirā'* [from Arabic *dhar'*, see above]

Insofar as this expression was used in the areas influenced by Persian culture, it corresponded to the above *ẓar* and *gaz*. In Turkey, one *ẓirā* amounts today to 65cm (see also the above referred to *al-dhira' al-Istanbūliyyah*). In the Indian Mughal empire, there existed a "royal cubit" (*ẓirā'-i pādishāhī*) at 40

444 Jālal al-Dīn Muḥammad Munajjim Yazdī, *Ta'rikh-i 'Abbāsī*, MS Elliot 367, Bodleian Library, Oxford, fol. 267b.

445 *Journal Asiatique 2* XVI (1920), p. 113.

angust each, which measured exactly 32 inches or 81.28cm. The Mughal emperor Akbar [r. 1556–1605] standardised this "cubit" toward the end of the 16th century at 41 *angusht*. His "royal cubit" thus measured 83.31cm (see *angusht*). In the year 1647, however, the former "cubit" which, as just mentioned, had measured 81.28cm, was reintroduced officially in Agra.[446]

4 Square Measures

4.1 *'ashīr*

The square measure *'ashīr* corresponded to the square *qaṣabah* (see Part 3) or to 6 big square *hāshimī* "cubits".[447] Since we have already ascertained the *qaṣabah* with a high degree of exactitude at 399cm, we thus arrive at 15.92m^2 for one *āshīr*.

4.2 *azālah*

One *azālah* measured 100 by one "scales cubit" (see *al-dhira' al-mīzāniyyah*) at 145.63cm each, thus 145.63m^2.[448]

4.3 *dāniq*

An Egyptian square measure, corresponding to $^{1}/_{6}$ *qīrāṭ*, today measuring 29.172m^2.[449]

4.4 *faddān*

The predominantly Egyptian square measure *faddān* amounted to

446 Confer W. H. Moreland, "The Mogul Unit of Measurement", in: *Journal of the Royal Asiatic Society* (1927), p. 102.

447 Al-Māwardī, ed. M. Enger, p. 265; *Ta'rīkh-i Qumm*, p.109.

448 *Journal Asiatique* 8 VIII 91886), p. 480.

449 *Mitteilungen des Seminars für Orientalische sprachen, Westasiatische Studien* (Berlin 1925), p. 23.

400 square *qaṣabah*, according to *al-Qalqashandī* [1355–1418].[450] The *qaṣabah* (see Part 3) has been ascertained at 399cm. We should thus be able to assume an area of 6,368m² for one *faddān* during the Middle Ages. During the 19th century (up to the year 1830), one *faddān* amounted merely to 333 1/3 square-*qaṣabah*,[451] and thus corresponded to an area of 5,306 2/3m². After the year 1830, the *qaṣabah* had been been reduced to 335cm, as mentioned in Part 3. Since then, one *faddān* in Egypt has equalled 4,200.833m².[452]

4.5 *ḥabbah*

An Egyptian square measure at 1/3 *qīrāṭ* or 1/72 *faddān*, today corresponding to 58.345m².[453]

4.6 *jarīb*

During the early and high Middle Ages, one *jarīb* amounted as a square measure to 100 square *qaṣabah*[454] and thus quite exactly to 1,592m² (one *qaṣabah* = 399cm, see Part 3). This *jarīb* was known in Fārs as the "small *jarīb*", namely at 60 by 60 "royal cubits" (*dhira' al-malik*), the "big *jarīb*" amounting to 3 2/3 of such "small *jarībs*" thus measuring 5,837 1/3m².[455] During the later Middle Ages, the *jarīb* comprised a square area with a side length of 32 2/3 *gaz*, thus 1,066 square *gaz* (see Part 3), one *gaz*

[450] Al-Qalqashandī, *Ṣubḥ*, III, p. 446.

[451] E.W. Lane, *An Account of the Manners and Customs of the Modern Egyptians*, vol. II (London 1836), p.371.

[452] *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 23.

[453] Ibid.

[454] Al-Māwardī, ed. M. Enger, p. 265.

[455] Ibn Ḥauqal (*BGA* II, 1873), p. 216; al-Iṣṭakhrī (*BGA* I, 1870), p. 157; the statement by al-Muqaddasī (*BGA* III, p. 451), according to which the big *jarīb* is said to have measured 70 x 70 "royal cubits", appears to be inaccurate.

calculated at 94.745cm.[456] Accordingly, one *jarīb* during the 17th century measured 30.95 by 30.95 metres, i.e., 958m². It is not possible to ascertain when the reduction of the *jarīb* from around 1,600m² to about 960m² took lace in the areas under Persian cultural influence. Some indicators, which we cannot refer to here in detail, suggest that this reduction already existed during the 15th century. Today, one *jarīb* equals officially one hectare in Iran. However, a variety of local square measures, which fluctuate between about 400 and 1,450m², continue to exist. For example, the *jarīb-i shāh* equals 1,200m², the *jarīb-i rasm* being equal to 760m².[457]

4.7 *marja'*

A predominantly Maghribine square measure at 40 square *rashshāshī* "cubits" (see *al-dhirā' al-rashshāshiyyah*, Part 3),[458] and thus equal to 467.4m² (since the respective "cubit" is equal to the "black cubit" at 54.04cm).

4.8 *qafiz*

As a square-measure it was equivalent to 1/3 *jarīb* or 360 square "cubits",[459] and thus, according to the above calculation, to 159.2m².

4.9 *qīrāṭ*

An Egyptian square measure, today equal to 1/24 *faddān* or 175.035m².[460]

[456] Chardin, *Voyages*, ed. Langlès, vol. IV (Paris 1811), pp. 176–77.

[457] A. K. S. Lambton, *Landlord and Peasant in Persia* (London 1953), p. 407.

[458] *Journal Asiatique* 8 VIII (1886), pp. 488-89.

[459] Al-Māwardī, ed. M. Enger, p. 265; *Ta'rikh-i Qumm*, p. 109.

[460] *Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien* (Berlin 1925), p. 23.

4.10 *sahm*

An Egyptian square measure, today equal to $^1/_{24}$ *qīrāṭ* or $7.293m^2$.[461]

[461] Ibid.